



Docket: A-1955

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of:	/	Confirmation No.: 1924
Babel et al.	/	
	/	Examiner: George P. Wyszomierski
U.S. Serial No: 10/658,598	/	
	/	Group Art: 1742
Filed: 9/8/2003	/	Customer No.: 33197

For: LARGE DIAMETER DOMES AND METHODS OF MANUFACTURING  
SAME

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**PRE-APPEAL BRIEF REQUEST FOR REVIEW**

Sir:

Applicants request review of the final rejection in the above-identified application.  
No amendments are being filed with this request.

This request is being filed with a Notice of Appeal.

The review is requested for the reasons stated on the attached sheets.

Respectfully submitted,

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October 20, 2005  
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**CERTIFICATE OF MAILING**

I hereby certify that this correspondence is being deposited with the  
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10/20/05

October 20, 2005



Claims 1-9 and 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2001-001059 in view of Shrayner et al. '419. The Examiner admits that "...JP '059 does not indicate that the latter step (of pressing or drawing) entails 'spin forming' or the various sub-steps recited in claim 1 as amended, does not disclose the dimensions as recited in claims 4, 5, 11 and 12, and does not disclose annealing prior to spin forming as required by claims 6, 8, and 13-15 or friction stir welding of pieces that are in annealed condition as defined in claims 9 and 16." However, the Examiner asserts that the "...Shrayner patent indicates that it was known in the art, at the time of the invention, to form dome-shaped articles from a flat blank by spin forming, and further discloses that spin forming includes the steps recited in claim 1 as amended." The Examiner further asserts, with respect to the claimed annealing step (claims 6 and 13), that "...Shrayner claim 6 indicates that it was well-known in the art, at the time of the invention, to anneal aluminum alloy blanks prior to spinning." He further asserts that, with respect to claims 9 and 16, "...the instant claims do not positively recite an annealing step but merely allude to one, i.e. material is processed that is in an annealed temper or condition. It is not possible to determine, in any of the prior art references, all of the possible treatments (including annealing) that the materials processed therein may or may not have been subjected to. Nonetheless, the processes of JP'059 or Shrayner would be applicable to being applied to annealed aluminum materials".

On the foregoing bases, the Examiner asserts that the combination of JP '059 and Shrayner et al. would have taught the presently claimed invention to one of ordinary skill in the art.

Applicants respectfully traverse the rejection posed by the Examiner. The JP '059 reference, as noted in the amendment filed on June 3, 2005, merely discloses the prior art already acknowledged by Applicants in the present application, which is friction stir welding of two fully heat treated aluminum plates, following which the resultant "wide flat plate" 23 is drawn into a parabolic shape for use as a parabolic antenna mirror surface plate. The drawing step is discussed in paragraph [0017] of the '059 reference, and is shown in Fig. 5 of the JP '059 reference. See the instant specification, page 3, lines 17-25, for a discussion of friction stir welding, as known in the art, and the fact that it is only known in connection with fully heat-

treated aluminum alloys. On the other hand, spin forming, as known in the art, is only known for forming parts which are in the annealed temper (page 3, line 25 of the instant specification). The Shrayner patent merely teaches this feature, already also acknowledged by Applicants in the present specification. It was the present inventors who determined that spun-form parts, in the annealed temper, could then be friction stir welded, as claimed, in that temper, without first being fully heat treated, as was standard prior art practice.

Independent claim 1 recites a method of making spin blanks greater than a predetermined size, which comprises providing at least two pieces of material having abutting edges, friction stir welding the two pieces together along the abutting edges to form a blank, and spin forming the blank into a desired article, wherein the spin forming step comprises clamping the blank, applying heat thereto, and rotating the blank while applying pressure to selected regions thereof using a tool. As the Examiner admits, the '059 reference does not disclose spin forming, but rather a drawing step. A significant difference between the two is that drawing is routinely performed on a fully heat treated plate, as is the case for the '059 reference, whereas spin forming is typically only performed on annealed plates (having a soft temper), as discussed above. Spin forming cannot be used to form a parabolic antenna mirror surface of the type disclosed in the Japanese '059 reference. Moreover, it would not have been obvious to spin form, rather than draw, the '059 product, because it is fully heat treated and not suitable for spin-forming.

While the Shrayner '419 patent discloses a conventional process for manufacturing a dome by spin forming said dome, as discussed in the present specification at page 1, line 17 through page 2, line 21, there would have been no motivation present in the prior art to apply the teachings of Shrayner et al. to the Japanese '059 disclosure to arrive at the claimed invention, absent reference to the present disclosure. The reason is simple. The drawing process disclosed in the Japanese reference requires a fully heat treated aluminum plate. In contrast, the Shrayner patent discloses a method of spin forming an annealed plate. To substitute the spin forming step of Shrayner for the drawing step of the Japanese '059 reference would have been unobvious because spin forming requires an annealed (softer) rather than fully heat treated, or finished, aluminum plate. Moreover, such a spin forming step is unsuitable to the fabrication of a mirror,

as taught by the Japanese reference. Thus, one ordinarily skilled in the art would never have made such a combination, based on the teachings of the two references at issue.

The Examiner avoids this problem with his reference combination by failing to make his *prima facie* case for obviousness. He never explains how it would have been obvious to combine the Shroyer et al. and Japanese reference disclosures. He further states that the distinction made between fully heat treated and annealed materials "is not persuasive of patentability because while the statements in the specification may reflect the present applicant's knowledge, such statements cannot be held to encompass all knowledge of practitioners in the aluminum processing art".

This statement is legally incorrect, even if true. Under the test of *Graham v. John Deere*, it is incumbent upon the Examiner to make a *prima facie* case of obviousness for the proposed reference combination. This means that the Examiner must present a threshold level of evidence to support his contention that it would have been obvious to apply the teachings of the Shroyer patent to modify the process taught by the Japanese patent. In contrast, the Examiner has offered no evidence of obviousness related to the combination of references to meet the claimed rejection. Rather, he attempts to force the Applicants to prove that the prior art does not teach the claimed invention, by merely stating that Applicants have not provided evidence of the knowledge of all practitioners in the aluminum processing art. Applicants have rebutted, with a well reasoned and supported position, the Examiner's unsupported statement that it would have been obvious to combine the teachings of Shroyer and the Japanese reference to obviate the claims. In response, the Examiner offers nothing other than a statement that Applicants have not proven the entire state of prior art knowledge. Obviously, this is an unacceptable and untenable position. It is up to the Examiner to supply evidence to support his contention that the state of the prior art is different than asserted by Applicants. See *Ex Parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (Bd. of Appeals 1979), *Ex Parte Gerlack and Woerner*, 212 U.S.P.Q. 471 (Bd. of Appeals 1980) (there is nothing in the statutes or the case law which makes "that which is within the capabilities of one skilled in the art" synonymous with obviousness). Thus, claim 1 is clearly patentable over the prior art of record.

In the Advisory Action mailed on October 4, 2005, the Examiner attempts to buttress his case by claiming that the referenced annealing step is indefinite. He cites an ASM Materials Engineering Dictionary for a definition of "annealing". Applicants do not dispute the cited definition. However, the term is well known in the prior art in connection with aluminum alloys of the type discussed in the present application. In this context, clearly described and supported in the present specification, the annealing step is for the purpose of re-crystallizing, and thus softening, the material so that it is in suitable condition for spin-forming. Applicants have not invented anything new in the area of heat treatment of metals. The annealing step, prior to spin-forming, and subsequent heat treating (hardening) steps, disclosed and claimed in the present application are similar to those disclosed in the Shroyer et al. '419 patent (see, for example, col. 4, line 60 through col. 5, line 54, and claim 6 for discussion of annealing steps and col. 6, line 45 through col. 7, line 13 for discussion of final heat treatment/finishing steps), which has been expressly incorporated by reference into the present application (page 2, line 26 through page 3, line 1 of the present specification).

It is noted, in the English translation of the JP '059 reference made of record earlier in the prosecution of this application, in paragraph [0019] that no finishing (work-hardening) of the joint 22 is performed after the drawing or pressing step, to avoid cracking. This is said to avoid the need for mirror surface modification. In paragraphs [0020] and [0021], it is repeated that an important feature of the invention is that there is no need to apply any finishing steps once the mirror has been formed. Since optical mirrors are precise instruments, this is an important advantage of the process disclosed by the JP '059 reference. Accordingly, it is abundantly clear that there would have been no motivation for applying the teachings of Shroyer et al. to the JP '059 reference, as such an application would have destroyed the advantages of the JP '059 process.

Claims 2-5, 7, and 11-12 are dependent upon claim 1, and are therefore patentable over the prior art as well. Claim 6 further recites a step of annealing the blank after friction stir welding, prior to the spin forming step. Clearly, for reasons discussed above, it would not have been obvious to modify the Japanese reference to include the recited annealing step, because the drawing or pressing step disclosed by the Japanese reference is not done to annealed metal, but

rather only to fully heat treated metal, so that a finished product results. Thus, claim 6 is clearly patentable over the prior art of record.

Claim 8 is dependent upon allowable claim 7 and further recites that the blank is annealed after friction stir welding and prior to the spin forming step. Clearly, this step is patentable over the combination of Japanese '059 reference and Shrayer patent proposed by the Examiner, for the reasons discussed above in connection with claim 6.

Claim 9 is dependent upon allowable claim 1, and further recites that the material pieces are friction stir welded in an annealed temper. This claim is allowable over the prior art, for reasons already discussed above.

Independent claim 13 is similar in many respects to claim 1, but specifically recites a step of annealing the blank after it has been friction stir welded and before the spin forming step. Clearly, this claim is patentable over the Japanese '059 reference, in combination with the Shrayer patent, for the reasons discussed above in connection with claims 1-9 and 11-12. Claims 14 and 15 depend upon allowable claim 13, and are clearly patentable as well. Independent claim 16 recites a friction stir welding step which involves a material in an annealed condition. This claim, as well, is patentable, for the reasons discussed above.

Applicants respectfully submit that this application is clearly in condition for allowance, and an early notification of same is respectfully solicited. The Examiner is requested to contact the undersigned at the number below, should any further questions or issues need to be resolved.